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1

①刺しゅう模様を設けた木質化粧板用材料

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⑨特許請求の範囲

1 紙または布に熱硬化性樹脂を含脂率45~55%に含浸せしめた裏打材料の上面に木質極薄単板を貼着してなる積層体に、該単板側より刺しゅう模様を施したことを特徴とする刺しゅう模様を設けた木質化粧板用材料。

2 紙または布に熱硬化性樹脂を含脂率45~55%に含浸せしめた裏打材料と該裏打材料の上面に貼着された木質極薄単板とからなる積層体に、該単板側より刺しゅう模様を施し、積層体の裏面には突出形成された刺しゅう糸層の厚さとほぼ同じ厚さの樹脂層を刺しゅう糸のない部分にのみ設けたことを特徴とする刺しゅう模様を設けた木質化粧板用材料。

発明の詳細な説明

本発明はツキ板特有の持味を喪失することなく、その表面にエンブroidリー刺しゅう模様を設けることにより色彩、絵画的要素を加味し、或いは潜在的に保有する裏割れ、穴あき等の欠陥を補強、陰蔽し高級家具用或いは室内壁面用等の広汎な用途に適する新規化粧板用材料の提供に関する。

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従来、サイドボード、テーブル、タンス、洋服タンスのような家具或いは室内壁面等に常用せられる化粧板は、通常、合板、パーティクルボードのような台板上に天然銘木より切削されたツキ板と呼ばれる極薄単板、合成樹脂含浸紙等を積層したものが用いられている。

そして、なかんづく前者の極薄単板の積層された化粧板は、極薄単板のもつ雅趣ある木理模様の顕現によつて高級家具、高級壁面の装飾等には欠くことのできない材料である。

ところが極薄単板は変化があり、しかもその形状が一定に揃つた木理模様、杻、瘤等をもつ天然銘木のフリツチより切削生産されるものであるが、その原木の産出は量的にみて数少く年年減少する傾向にあり、しかも切削作業は技術的に困難ではしばしば裏割れの発生があるばかりでなく、また天然物を破切削材料とするため、虫喰などによる穴あき、波打ち等のそのままでははぎ合せしても到底実用的に供することのできない廃棄せねばならないような細幅極薄単板が数多く副生されるのが実情である。

本発明の目的の一つは、かかる多量に副生される細幅極薄単板をはぎ合せることによつて得られる品位の低い化粧極薄単板に裏打層を設けその表面に各種の繊維糸によつてエンブroidリー模様を賦与し、これら単板のもつ裏割れ、穴あき等の欠陥を補強、隠蔽し、併せて変化に富む繊細美麗なる立体的模様を天然木理模様上に顕現せしめることにある。

また本発明の他の目的の一つは、品質のすぐれた広幅の化粧用極薄単板、或いは細幅の極薄単板より所望の幅にはぎ合わされた化粧用極薄単板に裏打層を設けその表面に各種の繊維糸によつてエンブroidリー模様を賦与し、天然の木理模様を併せてより一層の色彩変化、絵画的要素を付与せしめ品質の高級化を意図することにある。

更に本発明の他の目的は、前記のような意図の

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下で提供された化粧板用材料であるその表面にエンブroidアリー模様を有する極薄単板は、これを台板上に鞏固に積層させ各種の用途に適応する化粧板を提供することにあるが故に、裏打ちされた化粧用極薄単板の裏側に露出するエンブroidアリー模様の裏糸を隠蔽し該露出面を平滑化することにある。

本発明の技術的構成は、紙、布のような材料に熱硬化性合成樹脂系物質を含浸せしめた裏打層と化粧極薄単板即ちツキ板とからなる積層体において、該ツキ板の表側面には繊維糸を以てエンブroidアリー模様が立体的に形成され、裏打層の裏側面には前記形成されたエンブroidアリー模様の裏糸が露出してなる化粧板用材料に関するもので、この化粧板用材料を合板、金属板等の台板上に貼着するには積層体の裏面に突出した刺しゅう糸層とはほぼ同じ厚さの樹脂層を刺しゅう糸のない部分にのみ設けて、積層体の裏面をほぼ平らとしたのち貼着するとよい。

次に本発明の化粧板用材料を詳しく説明する。化粧板用材料を構成するツキ板は、天然銘木を角材などに木取りしたフリツチより例えば0.2mm乃至0.8mm程度の極めて薄くスライサーによつて平削された、木理通直、螺旋状木理、旋回木理、斜走木理、対角線木理、交錯木理、波状木理、縮歪、鳥眼歪、銀歪、如鱗歪、牡丹歪、縮緬歪、舞葡萄歪、漣歪、階段状歪、瘤歪等の肌模様をもつ化粧用極薄単板より選ばれる。なお、これらツキ板用に供せられる樹種としてはアカガシ、イヌエングジュ、オニグルミ、カキ、キリ、クス、ヤマグワ、ケヤキ、ケンボナシ等の国内産材、アフリカマホガニー、アボデイラ、エボニー、クインスランドウォルナット、コーア、シルギーオーク、ゼブラウッド、ダオ、チーク、ローズウツド、パロサピス、ブビンガ等の外国産材が挙げられる。

これらツキ板の裏面にはあらかじめ裏打層が設けられるが、その裏打形成材料は紙、織布、不織布などに熱硬化性合成樹脂を含浸したものである。

前記熱硬化性合成樹脂としてはフェノール樹脂、メラミン樹脂、不飽和ポリエステル樹脂、ジアリルフタレート樹脂、グアナミン樹脂、エポキシ樹脂等が用いられ、含脂率45-55%になるように処理される。含脂率を約55%以上にすると、被含浸材料の質、厚さによつて左右はされるが、

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一般に爾後のエンブroidアリー作業において針の円滑な運動を阻害されるがために前記のように考慮される。

なお前記含脂率とは、

$$\text{含脂率}(\%) = \frac{\text{樹脂量}(\text{g})}{\text{樹脂量}(\text{g}) + \text{基材重量}(\text{g})} \times 100$$

の式で表わしたものである。

そしてツキ板裏面にポリ酢酸ビニルエマルジョン、酢酸ビニル・アクリル酸エステル共重合体エマルジョンなどのような接着剤を介してこの裏打が貼着される。貼着は裏打材料上にツキ板を重ねホットプレスで加熱圧縮することによつて行うのが望ましい。

なお、この裏打材料に貼着されるツキ板には通常、多数枚の細幅のものをはぎ合せることによつて得られる所望の広さをもつた広幅薄単板が用いられるが、必ずしもそれに制限されるものではなく、もしもはぎ合せを必要としないような広幅のツキ板の場合にはこのものをそのまま使用し裏打材料を貼着しても差支えないことは当然である。

次に前記のようにして準備せられたツキ板と裏打材料からなる積層体は、そのツキ板表面の汚れ、塵埃等を十分に清浄したのち該面にエンブroidアリー模様が付与せられる。使用せられる繊維糸は種々の色彩のポリアミド糸、ポリエステル糸、綿糸、レイヨン糸、羊毛糸、絹糸或いは金糸、銀糸、平金糸等が所望の模様に応じて採択される。

エンブroidアリー模様の形成手段は、例えばらない平糸を用いてツキ板表面に密着せしめ隙間なく真直に並べ渡し模様全面を平坦に纏う平纏(斜、割纏)、糸を少しく太く右縫てになし裏打層裏面よりツキ板表面に抜き出す毎に左に廻し結び玉をつくりこれを連ねて模様を形成させる相良纏(玉、瘤纏)、模様を何段かに分け細い右縫糸を以て最初の一段を二乃至四分位の罫目に又は長短不揃いに纏い、二段目は上段の糸の間に挿し込みて纏い、順次三、四段に及ぼし、模様全面をツキ板表面のみえないように幾重にも纏つて埋める挿纏(ぼかし、統纏)、或いはツキ板表面に木綿糸、紙捻などによつて模様にしたがって緩ち又は貼りつけ、その上に各種の罫方を用いて本罫を施し肉を纏う高罫、或いは管罫、掛罫、星罫、けし罫、

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鹿の子織、つぎ針織等の刺繍法にもとづいて行われる。

エンブroidリー模様は前記したように繊維糸を以てツキ板表面から裏面に向つて連続刺込むことによつて所望の模様を顕現させ、ツキ板表面を被覆するものであるが故に、ツキ板表面の虫喰、割れ等の好ましくない部分は繊維糸によつて隠蔽されると共に補強される。

前記のようにしてエンブroidリー模様の賦与せられた本発明における第1番目の発明である化粧板用材料が提供せられる。このものは合板、パーティクルボード或いは金属板のような別に用意せられる台板上に貼着され家具、キャビネット、建築内装等に供せられる。

しかしながら、提供せられた化粧板用材料のうち、賦与せられたエンブroidリー模様が比較的粗なる密度であつて、その占める面積がツキ板全体からみて極めて僅かであつたり、模様形成用繊維糸が極めて細番手でしかも繊維材料が絹、レイヨン、綿などの吸湿性のようなものであれば、裏面に露出する裏糸は合板貼着に際し使用される接着剤層中に膨潤埋没され、なんらの支障をもたらすことなく台板上に平滑状に貼着されるが、もしもエンブroidリー模様の面積が大であつたり、緻密な模様であつたり、太番手の繊維糸を用いたような場合には、たとえそれが吸湿性繊維で形成されていたとしても、裏糸の露出は多量となり、その結果裏面の凹凸ははげしく、そのため台板に平滑状に貼着まることは技術的に困難となる。

本発明における第2番目の発明は、かかる台板貼着に際し裏面に露出する裏糸のため、これが障害して台板に強固に恒久的な貼着ができない場合を技術的に考慮して、該裏糸を隠蔽することなく該裏糸を含む裏面全体を平滑化してなるエンブroidリー模様の賦与せられた化粧板用材料の提供にかかわる。

そしてこの場合の平滑化手段としては、予めツキ板表面に顕現されるエンブroidリー模様の原図面よりスクリーン模様型を作製し、この模様型を裏面の裏糸によつて形成させる模様と一致させ、型上よりポリ酢酸ビニル、ポリアクリル酸エステル、酢酸ビニル・アクリル酸エステル共重合体エ

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マルジヨン或いはエポキシ樹脂、メラミン樹脂、尿素フォルマリン初期縮合物等を塗布又は塗擦し、裏糸以外の部分に前記熱可塑性、熱硬化性の合成樹脂の塗着層を設け、裏糸の露出による凹凸面を平滑化する方法を適用すればよい。

なおスクリーン模様型の製作はクロム塩・ゼラチン感光法、クロム塩・ポリビニルアルコール感光法などで知られる捺染用スクリーン模様型の作製に準じて行うことができる。

平滑化の手段は前記のようなスクリーン模様型を用いて精確に行うことができる。

そしてこのものを台板上に貼着する場合には、平滑面又は台板上に接着剤を塗布し、該接着剤を介して恒久的に台板上に本発明の化粧板用材料を貼着することができる。

次に本発明の実施例を示す。

ローズウッド材から厚さ0.2mmにスライスされたツキ板のうちから、虫喰、割れなどのある廃物視せられるようなものを選び、このものを幅5cm、長さ40cm位に裁断し、それを数枚揃えてはぎ合せして広幅の薄単板を準備する。そしてその裏面にポリ酢酸ビニルエマルジヨンを主体とする接着剤を塗布し、フェノール樹脂(レゾール型)を含脂率50%になるように含浸せしめたクラフト紙よりなる裏打紙を重ね仮接着しその後ホットプレスで熱圧縮(125℃ 7.5% 5分間)し積層一体化する。

以上のように台板上に広幅の化粧薄単板を積層したのち、その表面に種々の色彩をもつ60番手綿糸よりなる繊維糸を以て所望の図形からなるエンブroidリー模様が、虫喰、割れ部分を隠蔽するように賦与せられ本発明の第1番目の発明である化粧板用材料を提供することができる。

次にかくして提供せられた化粧板用材料はその裏面側の露出する裏糸によつて顕現する模様と合致せしめたスクリーン模様型を準備し、該模様型を置いて、その上から酢酸ビニル・アクリル酸エステル共重合体を主成分とする塗着用合成樹脂系組成物を塗りこむように塗擦して、裏糸露出以外の箇所全体に亘り塗着層を形成せしめ、全体を平滑化させる。

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WOODEN DECORATIVE LAMINATE MATERIAL WITH AN EMBROIDERED PATTERN
[Shishuu moyoo wo muketa mokushitsu keshoohanyoo zairyoo]

Maruyama Shooichi, et al.

UNITED STATES PATENT AND TRADEMARK OFFICE
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(Claims)

1. A wooden decorative laminate material with an embroidered pattern comprising a laminated body made of an ultra-thin wooden veneer bonded to the top face of a backing material where paper or cloth is impregnated with heat-hardened resin to a resin content of 45-55%; an embroidered pattern is applied from the veneer side.

2. A wooden decorative laminate material with an embroidered pattern comprising a laminated body made of an ultra-thin wooden veneer bonded to the top face of a backing material where paper or cloth is impregnated with heat-hardened resin to a resin content of 45-55%; an embroidered pattern is applied from the veneer side; a resin layer having approximately the same thickness as the protruded embroidered layer is bonded only onto the non-embroidered part of the laminated body's backside.

(Detailed Explanation of the Invention)

The present invention is concerned with offering the coupling of coloring and picturesque elements with the distinct qualities of a wood veneer sheet, with no loss thereto, by providing an embroidered pattern on its surface. The invention also concerns material for high quality household furniture proofed against such potential defects as potential under splitting and perforations, as well as a new decorative laminate suitable for wide-scale application on interior wall surfaces.

Decorative laminates formerly used regularly for such household furniture as sideboards, tables, chests of drawers, and hanging wardrobes, or for interior wall surfaces, generally employed an ultra-thin veneer of wood veneer sheeting shaved from precious woods, or

synthetic resin impregnated paper or cloth, that were then laminated onto a plywood or particle board base board.

The decorative laminate, in particular the former one with the laminated ultra-thin veneer, is an essential material for high quality household furniture and high quality wall decoration, whose quality is based on the exposition of an ultra-thin veneer's elegant grain patterns.

Ultra-thin veneers, however, have variations. In form they are a product shaved from the flitch of natural precious woods having regular grain patterns, straight grains, and knots. Viewed from a quantitative perspective the passing years will witness a tendency towards decreased yields of these raw woods. Moreover, there are technological problems attending any shaving operation. Not only are there frequent occurrences of under splitting, but because the shaved material is a product of nature, even in the long run after worm-hole perforations or rippled sections are pieced together, a byproduct of the operation, numerous narrow veneer strips, must be disposed of due to having have no practical application.

One object of this invention is to provide the backing layer of a low grade decorative laminate veneer resulting from grafting the considerable quantity of narrow veneer strips that constitute a byproduct of the shaving operation, then using different types of yarns to give the surface of this veneer an embroidered pattern. The under splittings and perforations of these veneers will be reinforced and concealed and, in addition, delicate, clean three-dimensional patterns rich in variation will show over the natural grain patterns.

Another object of the present invention is to provide a backing layer to double width, high quality decorative ultra-thin veneer or to decorative ultra-thin veneer pieces joined together in desired widths from narrow ultra-thin veneer strips, using different types of yarns to give the surfaces of these veneers embroidered patterns. In addition to the natural grain patterns a further layer of coloring variations and picturesque elements will be applied with the aim of giving them an upper grade quality.

There is yet another object of the present invention. The ultra-thin veneer, having the embroidered design on the surface of the decorative laminate material offered with the above-mentioned aims, is firmly laminated onto a base board to present a decorative laminate suitable for various types of applications. Consequently, the under threads of the embroidered pattern, which is exposed to the backside of the backed decorative ultra-thin veneer, are concealed, and the exposed surface is smoothed.

The technical construction of the present invention concerns a decorative laminate material. A laminated body made of a backing wherein paper or a cloth-like material is impregnated with a heat-hardened resinous material, and a decorative ultra-thin veneer, that is, a veneer sheeting. Three-dimensional yarn patterns are formed on the front surface of the sheeting with the under threads of the embroidered patterns formed on the backside of the backing layer exposed. In bonding this decorative laminate material onto such base boards as plywood and metal plates a resin layer having approximately the same thickness as the protruded embroidered layer is bonded only onto the

non-embroidered part of the laminated body's backside. It may also be bonded after the backside of the laminated body is smoothed.

The decorative laminate material of the present invention will next be explained in detail.

The veneer sheeting constituting the decorative laminate material is planed extremely thinly by a slicer into, for example, 0.2mm - 0.8mm sheets from the flitch of squared, natural, precious wood timber, and selected from a decorative, ultra-thin veneer having wood grain patterns that are straight, spiral shaped, circular, diagonally running, diagonal, mixed, wavy, contracted and furrowed, birds-eye speckled, light reflecting, fish-scaled, peony-shaped, creped, wheeling-grape clustered, rippled, stepped, and knotted. The following Japanese timber products are among the tree varieties available for these types of veneer sheeting: evergreen oak, Japanese pagoda, Japanese walnut (*onigurumi*), persimmon, paulownia, camphor, mountain mulberry, zelkova, and the Japanese raisin tree; the following foreign timber products therefor are: African mahogany, avodeira [as transliterated], ebony, Queensland walnut, koa [as transliterated], Silguy oak, zebrawood, daho [as transliterated], teak, and rosewood.

The backing is bonded beforehand onto the backsides of these veneer sheets. The backing material is paper, woven cloth, or unwoven cloth that has been impregnated with a heat-hardened resin.

Resins such as phenolic resin, melamine resin, unsaturated polyester resin, diallyl phthalate resin, guanamine resin, and epoxy resin are used for the heat-hardened synthetic resin and processed to have a resin content of 45-55%. When the resin content is greater than

55% the backing can be affected by the quality and thickness of the impregnated material, but in general, in the embroidering operation effected thereafter the smooth action of the needle is hindered, giving rise to the problems mentioned above.

The resin content can be expressed by the following equation:

$$\text{Resin content (\%)} = \frac{\text{resin weight (g)}}{\text{resin weight (g)} + \text{backing weight (g)}} \times 100$$

The backing is bonded onto the backside of the veneer sheet by such adhesives as poly(vinyl acetate) emulsion and vinyl acetate • acrylic ester copolymer emulsion. It is desirable that the bonding be executed by layering the veneer sheet onto the backing material and heat pressed with a hot press.

Wide thin veneers of a desired width, usually acquired by joining together a number of narrow sheets, are used for the veneer sheet bonded to the backing material, but this is not the only procedure for this purpose. In the case of wide veneer sheets that do not require this grafting it is natural to use the sheeting as is to bond it to the backing material.

The laminated body made from the above-prepared veneer sheet and backing material next has dirt and dust entirely cleaned off from the veneer sheet surface, after which an embroidered pattern is applied thereto. The yarns used are selected with regard for the desired pattern and include a variety of colored polyamide, polyester, cotton, rayon, wool, and silk threads, or else gold, silver, and flat metal threads.

The formation of the embroidered pattern is based on such embroidering methods as the following: plain embroidering [*hiranui*] (diagonal, *warinui*), where the threads of the woof are set in close contact with one another over the surface of the veneer sheet, crossing straightly aligned with no gaps and stitched evenly over the embroidered surface; beaded embroidering [*sagaranui*] (spherical, *kobunui*), where a slightly thick thread grasped and twisted to the right, then every time it is drawn through the surface of the veneer sheet surface from the underside of the backing layer it is turned to the left into a knot, making a bead, which is joined with the other beads to form the pattern; shaded embroidering [*hasaminui*] (gradation, *tsuzukinui*), where the pattern is apportioned into several levels and, using a thin, right-twisting thread, the initial level is stitched into seams having two to four quantiles or into long and short jogs, then the second level is stitched by inserting the thread in between upper level threads, followed thus sequentially by the third and fourth levels, after which the entire pattern surface is embroidered several times covering over the surface of the veneer sheet; raised embroidering [*takanui*] where, in accordance with a pattern, cotton threads or twisted-paper strings are sewn or pasted onto the surface of the veneer sheet, then, using various stitching methods, a thick, principal embroidery is sewn thereonto; or else tubular embroidering [*kudanui*]; covered embroidering [*kakenui*]; star embroidering [*hoshinui*]; poppy flowered embroidering [*keshinui*]; dappled embroidering [*shikanokonui*]; and successive-needle embroidering [*tsugibari*].

As indicated above, the embroidered pattern exhibits a desired form

by continuously stitching yarns into the surface of the veneer sheet to face its underside. Because this results in covering over the veneer sheet the sheet is reinforced while worm holes, splits, and other unwanted defects are concealed.

Thus the decorative laminate material of the first invention is presented by means of offering the embroidered pattern. This product is bonded onto such separately prepared base boards as plywood, particle board, or metal sheets, then used, among other things, for household furniture, cabinets, and decorating building interiors.

Among the decorative laminate materials presented, however, the embroidered pattern is of a relatively loose apparent density. From the perspective of the entire veneer sheet the surface covered is exceedingly little, and the yarns used for creating the patterns are of a very fine count. Moreover, if the textile material is silk, rayon, cotton, or other hygroscopic materials, the under threads exposed on the backside swell and become embedded in the adhesive layer used when bonding to the plywood. This is bonded evenly onto the base board with no difficulty; but if the area of the embroidered pattern happens to be a large, elaborate pattern, and even if formed with a hygroscopic textile, the volume of exposed under threads will be great when coarse count yarns are used, resulting in a seriously uneven undersurface. For this reason there are technical difficulties in evenly bonding the material onto the base board.

The second invention of the present invention technically considers cases where the textile material cannot be firmly and permanently bonded to the base board, because the exposed under threads prove to be an

obstacle when executing the bonding operation. This second invention therefore concerns offering a decorative laminate material that provides an embroidered pattern wherein, without concealing the under threads, the entire backside including the under threads is made smooth.

The following may apply as a means for smoothing the uneven surface of the exposed under threads to serve as means for smoothing the backside. A screen pattern is made beforehand from an original drawing of the embroidered pattern shown on the surface of the veneer sheet. This pattern is made coincident with the pattern formed by the under threads on the backside. Poly(vinyl acetate), polyacrylate or vinyl acetate • acrylic ester copolymer emulsion, or else epoxy resin, melamine resin, or initial condensate of urea formaline are either applied or embrocated from above the form. The layer of thermoplastic or heat hardened synthetic resin is then applied to the areas outside the under threads.

The screen pattern can be effected in conformity with the manufacture of textile print screen patterns known from the utilization such methods as the chromium salt • gelatin photosensitive method and the chromium salt • poly(vinyl alcohol) photosensitive method.

The smoothing means can be accurately effected using the above screen patterns.

When bonding this pattern onto the base board an adhesive is applied to the smoothed surface or to the base board. The decorative laminate material of the present invention can then be permanently bonded onto the base board thereby.

A working example of the present invention will next be given.

Worm holes, splits, and other noted waste are singled out from the inner side of a veneer sheet shaved from a rosewood timber to a thickness of 0.2mm. These are cut off into widths of approximately 5cm and lengths approximately 40cm, then several sheets are arranged and joined together to prepare a double width thin veneer. An adhesive, whose main constituent is poly(vinyl acetate) emulsion, is applied to the underside thereof. Backing paper, made of craft paper impregnated with phenolic resin (resol type) to a resin content of 50%, is superposed and provisionally fastened to the underside. This is then heat pressed with a hot plate (125°C , 7.5kg/mm^2 , 5 minutes) and laminated into a single body.

After the double width decorative thin veneer has been laminated onto the base board an embroidered pattern, composed of a desired figure with various colored yarns of 60 count thread, is applied to the surface of the veneer to cover the worm holes and split areas. Thus a decorative laminate material comprising the first invention of the present invention presented above can be offered.

The screen pattern, conforming to the pattern exhibited by the under threads exposed on the underside of the proffered decorative laminate material, is next prepared. The pattern is then laid, and the synthetic resin composition, whose principal constituent is an acrylic ester copolymer, is embrocated to plaster composition over from above the pattern. An application layer is formed over the entire area outside the exposed under threads, then the whole pattern is smoothed out.